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AUTHOR Lawrence, Ben; Jones, Dennis
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ABSTRACT

This paper discusses the nature, scope, and limitations of the Western Interstate Commission on Higher Education's Planning and Management Systems Program (WICHE-PMS). (1) It summarizes the goals of the program which are the improvement of (a) higher education institutional management, (b) statewide coordination, and (c) decisionmaking processes at the highest national levels. (2) It identifies the basic guidelines governing the program. (3) It describes the major functional areas for research and development essential to the improvement of higher education management. These include: (a) goal setting; (b) program planning and resource allocation; (c) execution, i.e., the operation of the institution to see that what has been chosen to be done is done well and efficiently; (d) evaluation; and (e) providing a common vocabulary to ensure comparability of data. (4) It identifies the research and development areas with which WICHE-PMS is currently working. And (5) it describes briefly the higher education management process and indicates the point at which each of the WICHE-PMS projects relates to this process. (Author/AF)

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THE COOPERATIVE DEVELOPMENT OF PLANNING AND MANAGEMENT SYSTEMS IN HIGHER EDUCATION: The Nature, Scope, and Limitations of the WICHE Planning and Management Systems Program

by

Ben Lawrence Ph.D.
Dennis Jones

with the assistance of
Edward H. Lyell

Western Interstate Commission for Higher Education

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ABSTRACT

This paper explicates the nature, scope, and limitations of the Western Interstate Commission on Higher Education's Planning and Management Systems Program (WICHE-PMS). The paper:

I. Summarizes briefly the goals of the WICHE-PMS Program--the improvement of:

   A. Higher education institutional management

   B. Statewide coordination

   C. Decision-making processes at the highest national levels

II. Identifies basic guidelines presently governing the WICHE-PMS Program--those determined by its advisory structure.

III. Describes major functional areas for research and development essential to the improvement of higher education management.

   A. Goal Setting: "What To Do" and "Why."

   B. Program Planning and Resource Allocation: Selecting objectives, program, and resource mixes which maximize the intended benefits to the students by using an iterative process of trade-off decisions at each level.

   C. Execution: The operation of the institution to see that what has been chosen to be done is done well and efficiently.

   D. Evaluation: Determining the extent to which the organization is accomplishing what it set out to do.

   E. Communication Base: Providing a common vocabulary to insure comparability of data.

IV Identifies the Research and Development areas with which WICHE-PMS is currently working.

A. Program Planning and Resource Allocation

B. Communication Base

V. Describes briefly the higher education management process, and indicates the point at which each of the WICHE-PMS projects relates to this process.

The Cooperative Development of Planning and Management Systems in Higher Education: The Nature, Scope, and Limitations of the WICHE Planning and Management Systems Program.

> *The size and complexity of higher education makes management in the traditional sense difficult. Higher education has some 7 million students in 2500 institutions. The largest system has 288,000 students, making it analogous to one of the larger cities in this country. Size is compounded by complexity, and an "education" or a "degree" is indeed a complex product. As institutions and systems of higher education have grown in size and complexity, and as resources to meet the growing needs have become more difficult to obtain, there has been an increasing call to account for the resources used and to demonstrate the benefits received.*

INTRODUCTION

The recognition of this call to accountability has resulted in a cooperative effort toward the development of planning and management systems for institutions of higher education. It is the purpose of this paper to explicate the nature, scope, and limitations of the Planning and Management Systems Program (WICHE-PMS) of the Western Interstate Commission for Higher Education. To do this it is necessary to:

I. Summarize briefly the goals of the WICHE-PMS Program.

II. Identify the basic guidelines which presently govern the developments of the Program.

III. Describe briefly the major functional areas for research and development essential to the improvement of higher education management.

IV. Identify the research and development areas with which WICHE-PMS is concerned and associate each of its projects (current and projected) with one of these areas.

V. Describe briefly the higher education management process and indicate the point at which each of the WICHE-PMS projects relates to the process.

I. The Goals

The rapid growth in size and complexity and the current demands for better accountability in higher education have highlighted the need for effective application of new management techniques in colleges and universities. In response to this need, a large number of institutions and agencies of higher education, with the assistance of WICHE, are seeking to develop new management concepts and techniques designed to assist in the:

A. Improvement of higher education institutional management

B. Improvement of statewide coordination

C. Improvement of decision-making processes at the highest national levels

For a more detailed description of the goals, see Appendix A.

II. The Guidelines for Program Development

There currently exists a set of guidelines for the WICHE-PMS program (see Appendix B), which have been drawn up with the participation and concurrence of the program's advisory structure. The guidelines may be modified by the advisory structure (particularly the Technical Council), as deemed necessary. Activities that are to be undertaken within the program are determined by the participating institutions and agencies through the advisory structure. Appendix C describes in detail the organization and make-up of the advisory structure.

III Areas for Research and Development in the Management Process

The management process in higher education is complex and interrelated. It occurs at many levels--department, campus, institution, system, state, and national. It has many commonalities at each of these levels and at the same time has many aspects that are unique to each level. In order to describe the areas in higher education management requiring research and development a very simplified process model for higher education management is proposed in Figure 1, page 4. This model should not be construed as a definitive statement of the process; it is merely one way to describe the process of higher education management. The various elements of the higher education management process can be grouped into four areas. These areas are somewhat arbitrary; nonetheless, they represent logical concentrations of research and development activities. These areas are:

A. Goal Setting

B. Program Planning and Resource Allocation

C. Execution

D. Evaluation

There is another area requiring research and development that impinges upon the entire management process and is a necessary foundation to research and development in each of the areas identified above. This additional foundation area may be referred to as the:

E. Communication Base

FIGURE 1

SIMPLE PROCESS MODEL FOR
HIGHER EDUCATION MANAGEMENT

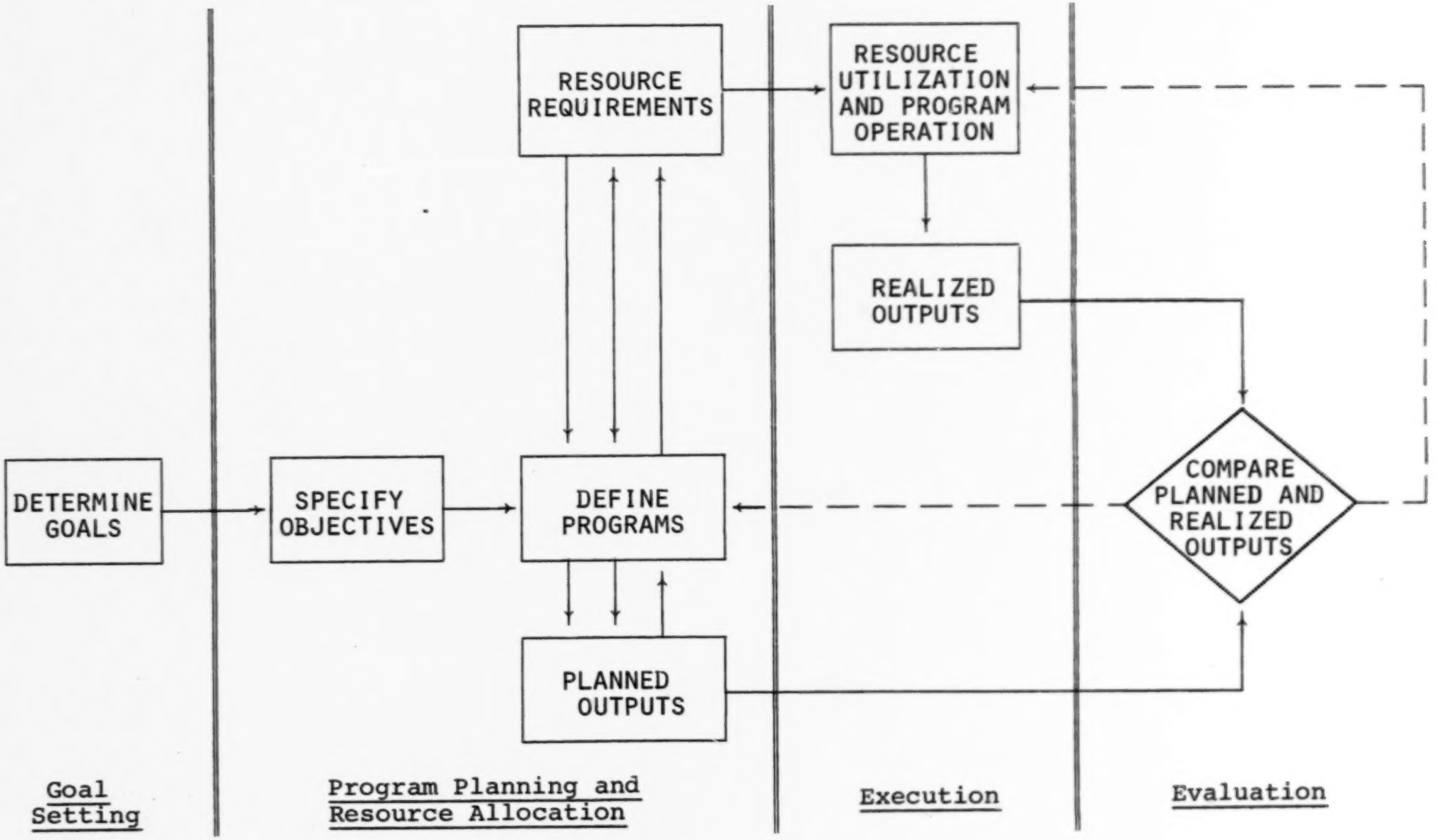


Figure 2, Page 6 depicts the five major areas of research and development deemed necessary to the improvement of higher education.

Of course, there is no clear-cut delineation between these somewhat arbitrary areas for research and development related to the management process, but describing them in the pure sense helps to understand better what the WICHE-PMS Program is attempting to do. These areas of research are closely related. The area of the communication base is of central importance because of its important linking function to each of the other major areas.

The following discussion of each of the identified areas for research and development serves to make more explicit the distinctions between the areas and to suggest examples of the kinds of research needed in each area.

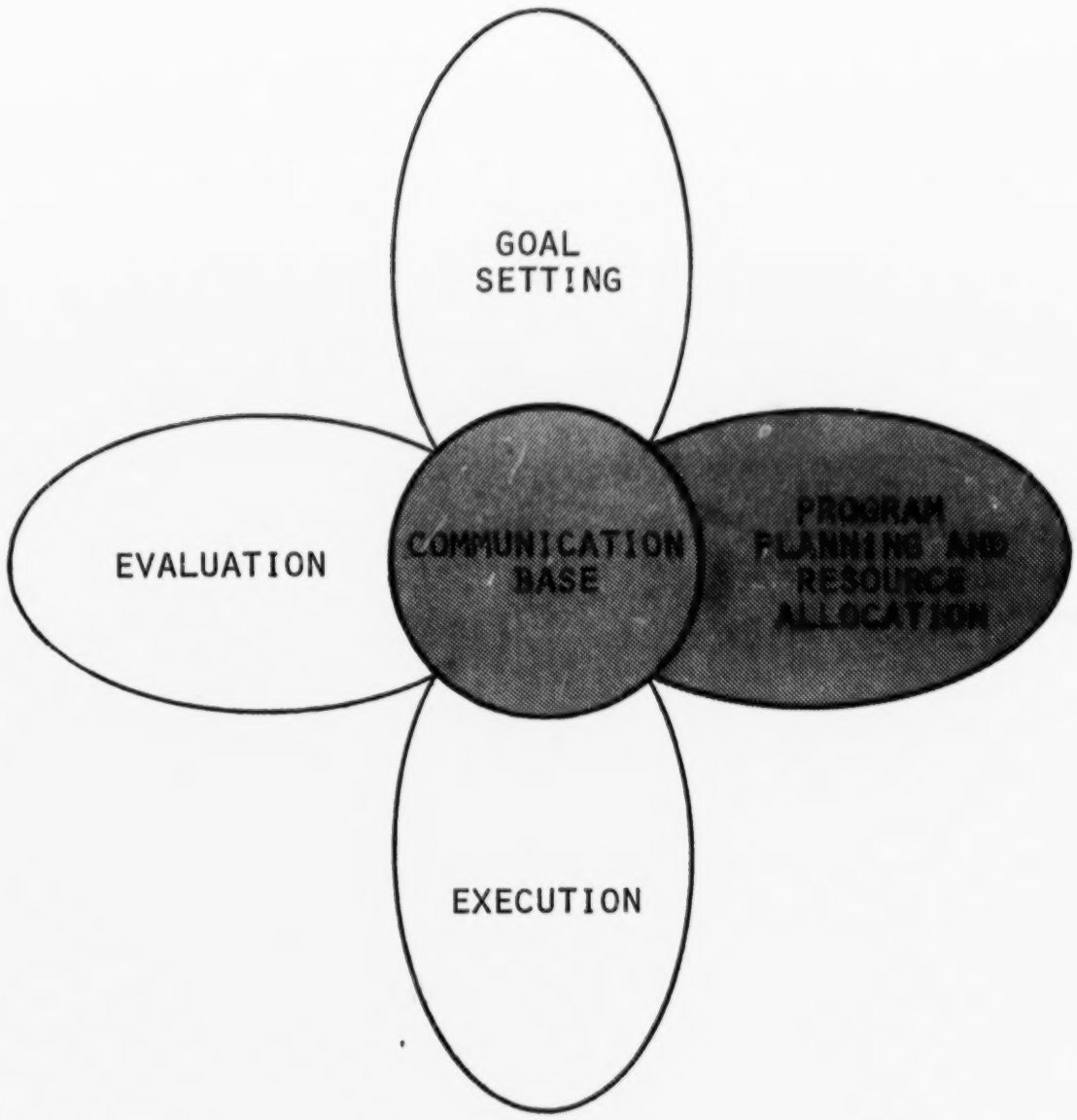
A. Goal Setting refers to that activity in which top-level management and the appropriate constituencies--for example, at the state level, the commission for higher education, the legislature, and the public--determine the broad value-oriented purposes of higher education. Goal setting determines "what to do" and "why" in the broad sense. For example, the following statement indicates the character of a goal.

> Higher Education in Colorado shall conduct research in the health care field and train health care manpower as required to maintain the standard of Colorado's health care service at the highest level available in the U.S.

While established goals are the foundation of the planning process, there is an almost total lack of understanding concerning the methods necessary to the formulation of such goals.

FIGURE 2

FIVE MAJOR FUNCTIONAL AREAS OF RESEARCH AND DEVELOPMENT ESSENTIAL TO THE IMPROVEMENT OF HIGHER EDUCATION MANAGEMENT



Areas in which WICHE Planning and Management Systems Division is currently working.

Examples of research and development needed in the goal setting area are:

1. Studies to consider problems and suggest models of organizational structures for higher education at all levels (Department through National) that will facilitate goal setting.
2. Research into the processes of determining goals and establishing consensus on these goals.
3. Development of exemplary sets of goals for different types of institutions and agencies of different levels that will serve the management function by enabling operational objectives to be developed from those goals.

B. Program Planning and Resource Allocation refers to that function of central or high level management which is principally oriented toward achieving what we call "economy in the large." This function:

   1. Determines and selects operational (quantifiable) objectives (chosen from among many feasible alternative objectives) necessary to accomplish the goals determined under the goal setting function.
   2. Identifies feasible alternative programs available to accomplish the objectives selected and specifies a set of outputs for each program.
   3. Calculates the resources--space, people, equipment, and dollars--necessary to support the respective alternative programs.

4. Evaluates the alternative programs by comparing the planned outputs with expected costs and then proceeds through an iterative process of evaluations and trade-offs until a feasible plan at a reasonable cost is determined. This may ultimately include a reexamination of the overall goals, if the resources do not appear to be available to accomplish the goals as initially established.

Examples of research and development needed in the area of program planning and resource allocation are:

1. Development of tools, techniques, and procedures to facilitate:
   a) the determination of resources required to support specified programs.
   b) the examination of trade-offs
      i-between alternative resource mixes
      ii-between alternative programs
      iii-between programs and objectives
      iv-between alternative objectives
      v-between objectives and goals

   This generally includes development of methods of generalizing alternative courses of action to accomplish objectives.
2. Development of specifications for the measurement of the outputs or benefits of higher education in such a manner as to facilitate the decision-making process.
3. Examination of alternative technologies to increase program productivity without loss of quality, i.e., E.T.V., C.A.I.,class size, curricular mix, etc.

4. Development of means to quantify goals in a manner which is useful to programming and resource allocation--specifying objectives.

C. Execution is that function of middle management which is concerned principally with achieving "economy in the small." It ensures that what has been chosen to be done is done well and efficiently. It takes the resources allocated and implements the planned program with the intention of producing the outputs as planned. For example, it ensures that work is performed smoothly and according to plan, that secretaries work the required number of hours each day, that supplies are not wasted or stolen, that property is protected, that professors and students get to the right room at the right time, etc., etc.

Examples of research and development needed in the area of execution are:

1. Faculty evaluation procedures
2. Personnel evaluation procedures unique to higher education management processes.
3. Design of operational systems related to:
   a) Students
   b) Admissions
   c) Registration
   d) Payroll, etc.
4. Development and evaluation of alternate teaching methodologies or learning situations.

5. Organizational unit studies

6. Procedural efficiency studies

D. Evaluation is that function of management which is concerned principally with determining the extent to which the organization accomplished what it set out to do. It measures the real outputs or benefits produced by the approved and implemented program and compares them with the planned outputs or benefits.

Evaluation requires the development and validation of a host of instruments designed to measure the various outputs of higher education, including the new ones currently being identified and defined.

E. Communication Base

A major element in the management of higher education at all levels is the use of comparable data.

1. Data needs to be comparable if it is to be:

   a) Aggregated

   b) Exchanged

   c) Incorporated into other equivalent data for reporting and analysis purposes

2. Comparability is dependent on three factors regardless of the level or management function:

   a) Standardized definitions of data elements

   b) Standardized procedures for aggregating, reporting and analyzing those data elements

   c) Agreement on qualitative aspects involved in comparison

3. Examples of research and development needed in the area of the communication base are:

   a) Data element dictionaries

   b) Uniform procedures for aggregating, reporting and analyzing data for comparative purposes at all levels and of all types.

IV. <u>The Areas of Research and Development in which WICHE is currently working</u>

The resources available to WICHE for research and development efforts would not be wisely spent if they were spread across the full spectrum of management. In cooperation with the participating institutions and agencies, those areas that were considered to be crucial to improved management in higher education were identified. The areas identified for the initial efforts of the program are:

The Communication Base

Program Planning and Resource Allocation

These areas are shaded in Figure 2 on page 6.

Table 1 on the following page lists the current and projected projects of the WICHE-PMS Program which fall into each of these two designated areas of research and development. No project can be said to fall exclusively in one category or the other but may be considered to have its primary purpose in that area.

TABLE 1

Current and Projected WICHE-PMS Projects

Communication Base Projects	Program Planning and Resource Allocation Projects
1. Data Element Dictionaries	1. Resource Requirements Prediction Model
2. Program Classification Structure	2. Student Flow Model
3. Personnel Classification Manual	3. Space Analysis Manuals
4. Faculty Activity Analysis	
5. Input-Output Indicators	
6. Cost Finding Principles	

PROJECTED	
1. Information Systems Design Manuals	1. Facilities Costs and Capital Financing
2. Information Exchange Procedures	2. Higher Education National Indicators Survey
3. Higher Education Finance Manuals	
4. Higher Education Facilities Manuals	

In addition, there are three projects that are designed to apply WICHE-PMS developed tools at specific levels of management in higher education and to develop tools identified as being particularly needed at those levels. These projects are:

1. Small College Demonstration Project
2. Statewide Planning and Management Systems
3. Departmental Management Systems

V. The Relationship of WICHE-PMS Projects to the Higher Education Management Process

Each of the projects in the WICHE-PMS Program (those contemplated as well as those under development) plays a definite role in the development of management systems which are intended for use in higher education at the institutional, state, and national levels. Furthermore, each of the projects is relevant to program planning and resource allocation and requires the kinds of skills being emphasized by the WICHE-PMS Program.

The projects can be grouped into two categories for discussion purposes:

A. Those projects concerned with the development of common data elements and common procedures. They contribute to the communication base previously described.

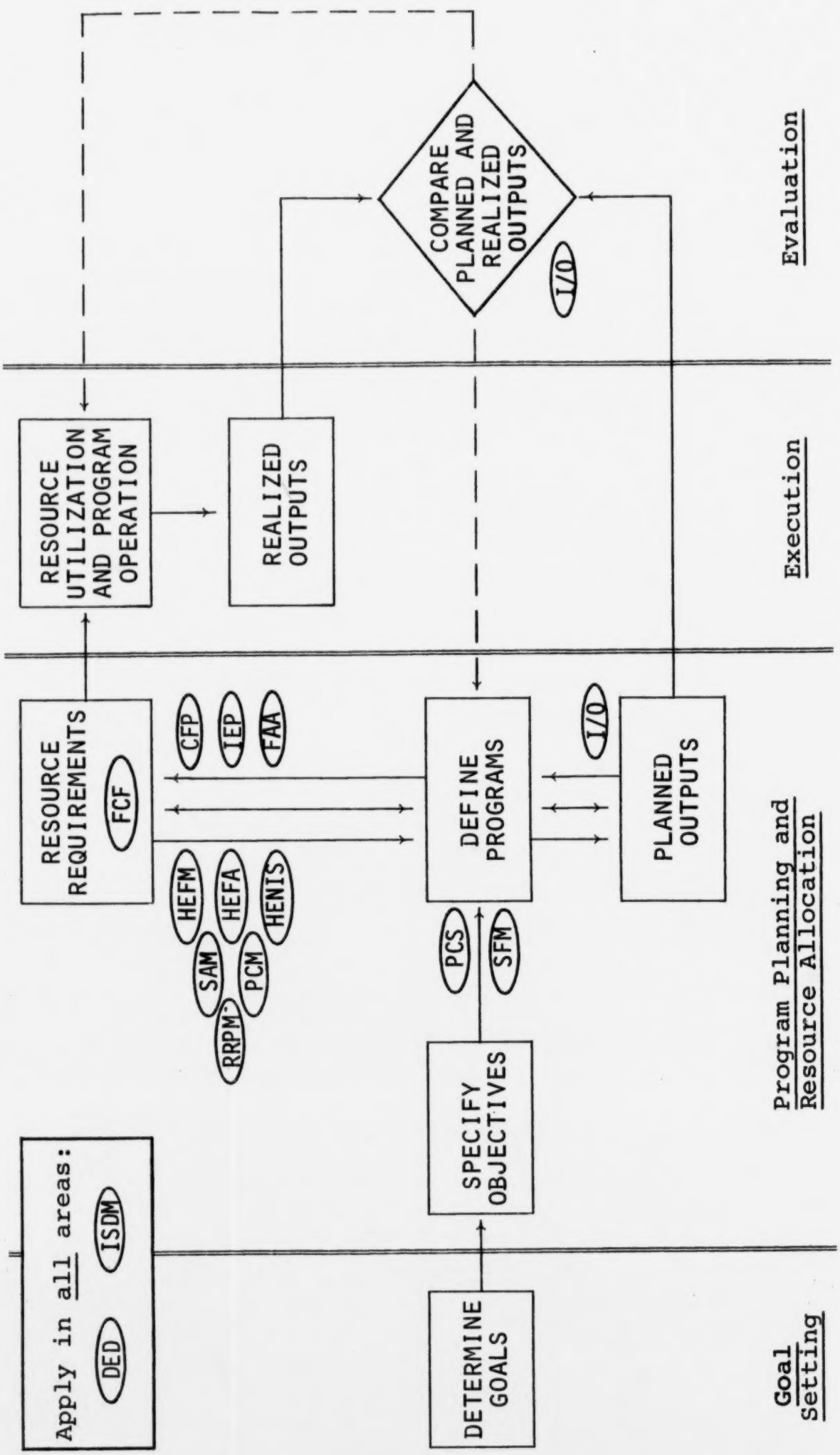
B. Those projects concerned with the development of analytical tools and procedures designed to improve the program planning and resource allocation process.

The categories and the specific projects included within each are discussed in the following sections.

A Simple Process Model for Higher Education Management was depicted in Figure 1 on page 4 and the major areas of the process were described in Section III, Figure 3. Page 14 presents this same process model, but includes an indication of the principal

FIGURE 3

WICHE-PMS PROJECTS WITHIN A SIMPLE PROCESS MODEL
FOR HIGHER EDUCATION MANAGEMENT



point of impact of each WICHE-PMS project--current and projected--whenever appropriate.

A. Those Projects Concerned with the Development of Common Data Elements and Common Procedures: The Communication Base

A major element in the management of higher education at all levels is the use of comparable data, (especially cost data). At the institutional level, interinstitutional comparisons are currently a particularly important aspect of an institution's evaluation process. Since the quality of outputs cannot yet be measured quantitatively, there is no way for an institution to perform cost-benefit analysis on a strictly intrainstitutional basis. In order for institutions to perform such analysis in the absence of quantitative output data, it is common practice for them to identify peer institutions which are perceived to generate outputs of the same quality and to compare specific cost data with similar data obtained from the peer institutions.

At the state and national levels, comparability of institutional data is even more critical. Since programs at these levels are implemented within institutions, evaluation of these programs cannot begin until data from various sources, different institutions, can be collected and aggregated in the necessary manner. In order to perform such aggregation, the data collected must be comparable.

As the need for, and trend toward, increased planning for higher education at the state and national levels continues, the need for a common data base and standard reporting procedures becomes even more important because evaluation of the state and national programs is completely dependent upon the availability of comparable data and information.

Comparability is dependent on three factors:

1. Standardized definitions of data elements
2. Standardized procedures for aggregating and analyzing those data elements which are so defined
3. Agreement on qualitative aspects involved in comparison

The WICHE-PMS projects which are concerned with the development of standardized terminology, uniformly defined data bases, and common procedures and conventions are:

1. Data Elements Dictionaries (DED)--This project is designed to define those data elements associated with students, staff, course, finance, and facilities which are necessary for generating comparable information. For pragmatic reasons, the initial emphasis has been placed on the data interrelationships between the execution and program planning and resource allocation aspects of the management process.

The DED project relates to the entire process of higher education management. It is absolutely essential to the development of comparable information at all levels.

2. Program Classification Structure (PCS)--The PCS project has as its objective the development of a common taxonomy of the programs and activities in higher education. The structure will define an exhaustive and mutually exclusive list of higher education's programs as viewed from the institutional level. Since programs are the common factors which run through all elements of the management function, the Program Classification Structure is of primary importance. PCS establishes the framework for all of the other projects within the WICHE-PMS Program.

The PCS project relates to the management process in higher education at the institutional level, primarily at the point where the program is defined (indicated by PCS on the model in Figure 3). However, it affects the entire process, for it is a necessary basis for the development of comparable information.

3. Personnel Classification Manual (PCM)--This project is concerned with developing a classification system for higher education personnel and with preparing a glossary of personnel terms. PCM is designed to expand the state of the art and to develop a system of personnel classification which fits within the framework of the Program Classification Structure. The PCM project provides the bridge by which data concerning personnel (as defined in the Data Element Dictionaries) are associated with programs (as defined by the Program Classification Structure).

The PCM project relates to the higher education management process at the point where resources are associated with programs as indicated by PCM on Figure 3.

4. Cost Finding Principles (CFP)--This project is concerned with developing conventional procedures for allocating all costs to specified programs within an institution. In particular, this project is designed to describe the procedures for allocating costs in such a way that the total costs of operating each of the programs can be determined. The determination of cost finding principles is a necessary step in the eventual development of comparable cost information.

This project also relates to the higher education management process at the point where resources are associated with programs as indicated by CFP on Figure 3.

5. Faculty Activity Analysis (FAA)--This project is designed to develop standardized procedures for analyzing faculty activities and to establish conventions for allocating faculty resources to the institutional programs. It is primarily concerned with developing common procedures to be used in sorting out the faculty resources devoted to various programs. As such, FAA is a fundamental component in the development of comparable cost data. Since personnel costs are the largest single item in most programs, it is imperative that those procedures developed to determine the costs of

each program are such that they accurately reflect the allocation of personnel resources to programs. This project, therefore, is intended to aid in the further development of Cost Finding Principles and the Cost Exchange Procedures project.

The FAA project relates to the higher education management process at the point where resources are associated with program, as indicated by FAA on Figure 2.

6. Higher Education Finance Manuals (HEFM)--This project is designed to develop procedures for aggregating institutional financial data as now maintained into the formats required by the use of program planning and management systems at the institutional, state, and federal levels. In the main, HEFM is designed to help the institutional administrator rearrange the financial data currently being collected into formats more specifically oriented to the needs arising from the use of planning and management systems methodologies at all levels of higher education.

The HEFM project relates to the higher education management process at the point where resources are associated with programs as indicated by HEFM on Figure 3. This project is relevant at all levels of higher education management.

7. Information Exchange Procedures (IEP)--This project is designed to develop and pilot test procedures for producing comparable data from institutions of higher education. The data to be produced will include, but will not be limited to:

a) Cost of instruction by level of student and field of study

b) Cost of instruction by level of course and discipline

c) Cost per unit of output, e.g., certificate or degree

This project is, in essence, the mechanism by which outputs of several other projects are orchestrated and interrelated (such projects as PCS, HEFM, CFP, and FAA). Given the specific procedures developed within these other projects, the procedures specified by the Information Exchange Procedures project will describe conventions concerning the ways in which the pieces will be woven into the information to be exchanged between institutions.

This project also affects the area where resources are associated with programs as indicated by IEP on Figure 3.

8. Input-Output Indicators (I/O)--As currently envisioned, this project is intended to develop a taxonomy of the outputs and activities of higher education, to suggest possible means of obtaining quantitative measures of these outputs, and to encourage the development of such measures. Inasmuch as WICHE-PMS is not stressing expertise in the behavioral sciences, the development

and validation of tests which measure these outputs are not considered as being within its area of greatest competence. By virtue of the nature of the program planning and resource allocation process, however, it will be necessary for WICHE-PMS to be actively involved in determining which outputs should be measured in order to provide the necessary information for decision-making.

This project relates to the management process in higher education at two points -- where planned outputs are postulated and where realized outputs are evaluated, as indicated by I/O on Figure 3.

9. Higher Education Facilities Manual (HEFA)--The objective of this proposed project is to produce a revision to the Higher Education Facilities Classification and Inventory Procedures Manual. The first edition of this manual was published by the USOE in 1968. It has since been used as the basis for the reporting of facilities data through the Higher Education General Information Survey. Widespread use of the material included in this document has pointed out several areas requiring revision and more explicit definition. In addition, a major element in the revision will be fitting the facilities elements within the framework of PCS. The manual provides uniform procedures for classifying and inventorying space within the institution.

This project also affects the management process at the point where resources are associated with programs as indicated by HEFA on

Figure 3. This project is relevant at all levels of higher education management.

10. Information Systems Design Manuals (ISDM)--The objective of this project is to develop and publish a comprehensive manual dealing with the concepts underlying the design, installation, and operation of information systems for institutions of higher education. Its four sections will include Concepts of Information Management, Concepts of Data Systems, Concepts of Installation Management, and Higher Education Applications.

The ISDM project relates to the entire process of higher education management and is imperative to the provision of readily accessible and easily analyzed data from the operating information systems to the program planning and resource allocation portion of the management process.

B. Projects Concerned with the Development of Analytical Tools and Procedures Designed to Improve the Program Planning and Resource Allocation Process.

In addition to those projects which deal specifically with the standardization of data elements and procedures, the WICHE-PMS program is engaged in several projects which have as their objective the development of certain tools which can be used to improve program planning and resource allocation. Whereas the projects in the

previous category were specifically oriented toward the present or the immediate past, the projects concerned with the development of models and other tools are oriented toward the future. The models are intended to aid in the investigation of the relationships between variables and possible future effects as one or more of these variables are changed. The role of these projects, with respect to the entire subject of planning and management systems for higher education, can best be explained by reference to Figure 3. These projects and their role in the larger scheme are as follows:

11. Student Flow Model (SFM)--This project is designed to develop analytical models which will aid in predicting student enrollments and will simulate student progression through post secondary education. At the institutional level, such a tool is necessary to an investigation of how a student body will become distributed over the various programs being offered and of how the institution can act in an effort to obtain the numbers and types of each of the student clientele desired. With reference to Figure 3, an institutional student flow model will aid in predicting the levels of activity within each of the institutional programs--SFM on Figure 3. A state-level student flow model will aid in predicting the distribution of students to institutions within the state.

12. Space Analysis Manuals (SAM)--The objective of this project is to write a series of manuals which describe and illustrate methods

and procedures for use in the planning and management of college and university facilities. As part of the planning process, this project is designed to provide methods of estimating the various types of facility resources required to support the different programs at the projected level of activity. As part of the management process, they are designed to aid in the allocation of existing facility resources to the current institutional programs. This project is intended to bridge the gap between programs and space resources as indicated by SAM on Figure 3.

13. Facilities Costs and Capital Financing (FCF)--The objective of this (proposed) project is to investigate the factors influencing construction and plant operating costs in colleges and universities. As an outcome of these investigations, methods will be developed for:

a) Estimating construction and plant operation costs
b) Analyzing the trade-offs between additional capital expenditures and operating costs
c) Allocating capital and plant operating costs to institutional programs for use in the analytical models and information exchange procedures being developed.

As indicated by FCF on Figure 3, FCF is designed to bridge the gap between space resources (as expressed in square feet), and space resources expressed in dollar terms. It is also intended to aid in investigating the production function.

14. Resource Requirements Prediction Model (RRPM)--This project is designed to develop an analytical model of the relationships between programs and levels of activity and resources required within programs. Inasmuch as planning is an iterative process, a tool which allows an administrator to determine quickly the resource requirements of different courses of action is extremely important. RRPM is intended to be such a tool. RRPM is the mathematical expression of the relationship between programs (and levels of activity within programs) and associated resource needs. RRPM relates to the management process as indicated by RRPM on Figure 3.

15. Higher Education National Indicators Survey (HENIS)--This project is intended to develop such things as lead lag indicators for income and expenditures for higher education (i.e, indicators which will function much as the consumer price index functions for the economy as a whole). The tools developed by such a project will be designed to aid decision-makers at the national level in testing the feasibility of pursuing certain programs (i.e., will it be economically feasible to undertake certain programs?). This is the only project currently being contemplated which will not deal primarily with specific elements of an institution's decision-making processes. It will draw upon the information and information exchange procedures developed by the WICHE-PMS Program.

C. Other Projects

In addition to those projects which can be readily grouped into one of the two previous categories, WICHE-PMS has proposed three more projects which are designed for use by special audiences within the higher education community. These projects are:

1. Small College Demonstration Project (SCDP)--This project is intended to:

   a) Identify the products of WICHE-PMS which could be most appropriately adapted for application in small colleges

   b) Make whatever modifications in these tools necessary to meet the special needs of small colleges

   c) Implement these tools and procedures in three to five small colleges in an exemplary fashion

   d) Provide mechanisms for displaying the results to representatives of other small colleges

2. Statewide Planning Systems (SWPS)--This project covers a wide scope of activities from development of tools which aid in establishing goals and objectives for higher education at the state level to development of procedures which will aid in investigating the sensitivity of institutional programming to programs at the state and national levels.

   Particular attention will be devoted to the integration of state and federal processes with those which occur within the institution.

This project relates to the higher education management process at the point where resources are associated with programs and objectives.

3. Departmental Management Systems (DMS)--This project will address those elements of the higher education management process which are of particular concern to department chairmen. Tools and procedures will be developed which will help department chairmen in areas such as:

   a) Allocation of faculty resources to particular activities
   b) Investigation of the implications of alternative instructional technologies (lecture, closed-circuit TV, computer-assisted instruction)

Appendix A

GOALS OF THE WICHE

PLANNING AND MANAGEMENT SYSTEMS PROGRAM

A cooperative project among higher education institutions and coordinating agencies to design, develop and implement management systems and data bases including common uniform data elements.

PROJECT GOALS

The rapid growth in size and complexity of higher education has highlighted the need for systematic collection and use of data in the effective management of colleges, universities, and state systems of higher education. Without systematic, accurate feed-back to management of the effects of its operations, an institution or system can waste its resources on ineffective or unnecessarily costly activities. Judgements about effectiveness and relative costs, however, cannot be made adequately in isolation. Hence, the need also for comparable data from other organizations of similar complexity and with similar missions.

In meeting these common needs, state coordinating agencies and concerned colleges and universities have asked the Western Interstate Commission for Higher Education to bring together a highly competent staff to develop new planning and management concepts and techniques designed to assist in the:

1. Improvement of higher education institutional management;
2. Improvement of statewide coordination; and
3. Improvement of decision-making processes at the highest national levels.

The achievement of these goals will be accomplished through the design, development and implementation of planning and management systems, which will be based on information systems that have common data elements. These systems will be designed to benefit the entire range of higher education organizations including public and private community colleges, four-year institutions and universities as well as local, state, regional and national agencies.

The purposes of the planning and management systems and data bases in relation to the achievement of the three stated goals will be to:

1. Promote the development of various aids to more knowledgeable resource allocation within institutions and agencies of higher education.

2. Enhance the ability of institutions and agencies to exchange and report comparable information; and,

3. Assist the participating institutions and agencies to implement the products of this Program through a variety of training seminars and materials

At the request of the cooperating organizations, the initial phases of this project are concerned with establishing a preliminary set of common data elements, program elements, program classification structure, program budget categories, and quantitative indicators; designing and implementing compatible management systems which will provide uniform data from which can be derived the costs of instructional programs by level of course, level of student and field of study. To be eligible for inclusion in the project, institutions must be willing and able to cooperate in these activities.

The specific project objectives planned to assist in fulfulling the stated goals are described in Sections 5, 6, and 7.

Subsequent phases of the project will be devoted to:

1. Refining the planning and management systems and data elements, input-output indicators, and cost relationships of the instructional program;

2. Beginning the task of identifying cost and benefit indicators of research and public service programs;

3. Disseminating information about the project and developing procedures whereby institutions and agencies participating in the project can benefit profitably;

4. Performing maintanance operations on the systems which have been developed so as to reflect subsequent progress and developments.

The following missions are essential to the successful achievement of the project goals and purposes and also will be undertaken by the project staff:

1. Stimulating, coordinating and conducting educational programs at various levels for all institutions and agencies who wish to develop their capability to cooperate in this project. This will include inter- and intra-campus seminars in systems analysis, operations research, program budgeting and cost-benefit analysis; the use of simulation models for training high-level management in the application of these decision-making tools under a variety of institutional

circumstances; the publication and distribution of staff technical reports developed in the process of establishing data definitions, program elements, system applications, input-output indicators, and program budget categories.

2. Coordinating development of data elements and information systems at regional and national levels, through cooperation with other regional and state level organizations.

3. Coordinating the exchange of comparable higher education management data among the cooperating agencies and institutions in the nation at their direction.

The initial mission of the project is to establish the mechanisms by which these objectives will be achieved which include:

1. A central professional staff headed by a Director with extensive experience at a high level in the management of higher education. The Director will be assisted by a staff with substantial experience and demonstrated ability in developing planning and management systems and the application of computers to their operation. The staff will be assisted by appropriate specialists employed by WICHE or contributed by the cooperating organizations as they are needed.

2. An advisory structure, representative of the organizations cooperating in the project, to monitor and guide the work of the central staff.

Appendix B

GUIDELINES FOR PROGRAM DEVELOPMENT

Initial Emphasis: Cost of Instructional Program

The initial phases of the Program will be concerned with the development of tools to aid in deriving information about the costs of student instruction, including those aspects of research and external service which are directly related to costing the various elements of student instruction. From this initial emphasis the project will move forward to include all categories of information relevant to resource allocation on the campus and state systems.

Universality

The most important guideline is that the set of data which is collected must be of the greatest practical universality and flexibility so that all levels of institutions and any individual institution can use on a common and consistent basis those parts of it of interest to them beyond the requirements for participation. Similarly, allowance must be made for suitable aggregation of the data so that they may be used for review purposes at echelons above the campus level.

Expandability

The Program started with a small nucleus of institutions and agencies which have information systems and are ready to adopt the common data elements required for deriving instructional cost data. At the same time, a larger number of institutions and agencies participated with the staff to develop management systems with common data elements. During the past year these institutions were added to the nucleus.

During the current phases of the Program deliberate efforts will be made to expand the network to include any institution or agency wishing to participate using the various products developed by the Program.

Comparable Data

The data in the system should be capable of being compiled in a variety of formats for reasonably comparable results without requiring all institutions to go to a single operating system. This requires common data element definitions (or translation algorithms) so that institutional information can be incorporated into various studies for comparisons of costs and effectiveness. Wherever possible existing definitions should be used.

Framework for Exchange

It has proven necessary to develop a standard classification of institutional activities which will provide the framework for information exchange. This classification system is referred to as the WICHE Program Classification Structure. It provides a consistent means of identifying and organizing the activities of higher education in a program-oriented manner. Together with the WICHE Data Element Dictionary, the Program Classification Structure provides the basic foundation for establishing a framework to facilitate the exchange of management information among institutions and agencies of higher education.

Exchange of Data

For internal administrative purposes and external policy development, institutions and agencies will inevitably compare programs. A common reporting framework will increase the ease and sophistication of such comparisons. Clarifying the relationships between program activities, costs and objectives can help avoid the now frequent "apples and oranges" errors in comparative studies.

Frequently unnecessary amounts of work are involved because of the slightly different form of data requests from another institution, a state agency or of the U. S. Office of Education. The implementation of compatible systems of data reporting will alleviate this situation to a significant degree.

Data Requirements for Management Decisions

Requirements for resource allocation decisions entail a need for specialized data systems which rapidly, accurately, and routinely provide information to managers at all levels to assist them in making better decisions about preferred courses of action. The development of analytical models will help to identify and understand the implications of alternative policy decisions.

Institutional Programs and Program Budgeting

Instruction, research,and external service are the three major program categories of universities while liberal arts colleges focus primarily upon instruction. Supporting program elements are libraries, plant maintenance and operation, student services, general administration, institutional research, organized activities and auxiliary enterprise activities.

A useful tool for higher education will be the program budget which relates program activities to institutional goals and highlights the principal resource allocation decisions.

The building blocks of major programs must be uniformly defined in a manner which will allow individual institutions to organize them as they wish, yet allow reorganization and comparison by institutions which organize their programs in a sligihtly different manner.

Institutional Goals

Colleges and universities have multiple goals. It is necessary for the administration of an institution to articulate institutional goals and do so in a manner which facilitates the relating of program activities and resources to objectives. This is basic to the program budgeting and cost/benefit approach. These relationships should also be made clear in an academic plan for the institution.

Faculty Workloads

Reasonably accurate data on salaries paid professors is now collected but there is incomplete data on faculty workload. New tools are needed to help determine the manner in which faculty resources are utilized to accomplish institutional objectives and the relation of faculty expenditures to program costs.

Cost - Benefits

Management needs to know the relationship between costs and whatever criteria of effectiveness or benefit they establish as the basis for efficient allocation or resources. The information systems will provide these data. It should be stressed, however, that the data and its analysis do not establish the effectiveness of benefit criteria.

The difference between inputs and outputs may be interpreted as "value added" or "benefits" to either the student, knowledge, or the public. Relating the amounts of resources used in a program to the difference between inputs and outputs may possibly yield a cost/benefit index.

At this state there is little agreement as to what exactly should be measured or how, when considering the outputs of a program. Value added is a concept important to determining cost/benefit. While it is difficult to identify and measure, the attempt must be made. Is it true, for example, as some research findings suggest, that the quality of an institution's graduates is determined largely by the quality of student it admits rather than by "adding values" to the person during his student years?

Competent Staff Analysis: The Key

The development of planning and management systems will be of little benefit to an institution or agency unless trained staff are available to conduct appropriate analyses for administrative decision-making. It is recognized that many institutions are not adequately staffed for these functions at this time. Therefore, it is necessary to establish a comprehensive training effort to accompany the systems developments and urge strengthening of this capability along with the systems effort.

APPENDIX C

ADVISORY STRUCTURE FOR THE WICHE
PLANNING AND MANAGEMENT SYSTEMS PROGRAM

As the WICHE Planning and Management Systems (PMS) program enlarges in scope, reorganization of the advisory functions is necessary for the successful operation of the program. Formal communication lines between the staff and the program's constituency must be developed and maintained in order to maintain a continuing basis for obtaining general, policy, and technical advice from the larger community. The following advisory structure has been established to accomplish these aims:

ADVISORY COUNCIL: a group to provide communication between the program staff and the participating institutions and agencies. Advice of a useful nature can result only when the participants are adequately informed of the progress of the program and when interaction among all participants is fostered. The Advisory Council will provide the basis for maintaining liaison between the staff and the various segments of higher education that are participating in the program.

Responsibilities:

To provide:

a) a general forum in which participants can discuss the status and development of management systems in higher education,

b) a sounding board for those who are responsible for the policy planning and program development of management and information systems in higher education, and

c) a mechanism for the timely communication of developments within the WICHE Planning and Management Systems Program.

Membership shall include:

a) Former WICHE Management Information Systems Steering Committee members as constituted at its last official meeting before dissolution.

b) A representative (chief liaison officer) from each of the institutions, agencies, or higher education systems registered as participating in the WICHE Planning and Management Systems Program at Levels III or IV.

c) Invited observers, as specified by the Director of the Planning and Management Systems Program.

d) An institution or agency will be represented on the Advisory Council as long as the participant remains at Level III or IV. The representative (chief liaison officer) is designated by an appropriate officer of the Level III or IV participant.

Meetings:

a) The Advisory Council shall meet twice annually.

b) The time, place, and agenda of the Advisory Council meetings shall be determined by the Executive Committee.

c) The Chairman of the Executive Committee will preside over Advisory Council sessions.

d) Unless the Chairman shall rule otherwise, decisions shall be reached by consensus.

e) The Chairman shall state each decision and the major points of discussion leading to the decision so as to afford the opportunity for contrary professional opinion to be recorded.

NATIONAL ADVISORY PANEL: a group to provide advice from national and regional organizations.

Responsibilities:

To provide advice concerning:

a) national priorities for Planning and Management Systems development,

b) relationships between the WICHE Planning and Management Systems Program and similar or related efforts elsewhere in the nation, and

c) program objectives, guidelines, and procedures.

Membership:

a) Members are appointed by the Executive Director of WICHE in consultation with the Director of the Planning and Management Systems Program.

b) Term of membership is two years beginning on July 1. Appointments will be made annually on June 1. The terms are staggered in order that each year approximately one-half of the membership is rotated. Members may be reappointed.

c) The following categories are represented:

1) higher education associations,

2) national professional organizations that have an interest in, or concern for, higher education planning and management systems, and

3) regional and national compacts for education.

d) The Chairman will be appointed annually by the Executive Director of WICHE in consultation with the Director of the Planning and Management Systems Program.

Meetings:

a) The National Advisory Panel will meet twice annually.

b) The time, place, and agenda of the National Advisory Panel meeting will be determined by the Chairman and the Director of the Planning and Management Systems Program.

c) Unless the Chairman rules otherwise, decisions shall be reached by consensus.

d) The Chairman shall state each decision and the major points of discussion leading to the decision so as to afford the opportunity for contrary professional opinion to be recorded.

EXECUTIVE COMMITTEE: a group to advise the Director concerning the general development and direction of the WICHE Planning and Management Systems Program.

Responsibilities:

To provide advice concerning:

a) major priorities for program development,

b) establishment of coordinated and cooperative efforts for Planning and Management Systems development,

c) relationships between the program, its participants, and other related planning and management systems developments,

d) major committee appointments, and

e) selection of pilot institutions.

Membership:

a) The Executive Committee will have at least 20 and no more than 25 members.

b) Members are appointed by the Executive Director of WICHE in consultation with the Director of the Planning and Management Systems Program.

c) The term of office is 2 years beginning on July 1. Appointments will be made annually on June 1. The terms shall be staggered in order that each year approximately one-half of the membership is rotated.

d) The following categories are represented: (These are not necessarily mutually exclusive groups).

1) the Planning and Management Systems Advisory Council,

2) the Planning and Management Systems National Advisory Panel,

3) the Planning and Management Systems Technical Council,

4) each major geographic region or major regional compact for higher education,

5) state-wide coordinating agencies,

6) community colleges,

7) multi-campus systems (central office),

8) private four-year colleges,

9) private universities,

10) public four-year colleges, and

11) public universities.

The Executive Committee members shall be appointed in such a manner as to ensure that approximately one-half of the membership represents institutions of higher education (i.e., colleges and universities) with an adequate number of representatives from the private sector. The remaining members of the Committee shall be representative of the various agencies and associations of higher education with an adequate number of representatives from statewide coordinating agencies.

e) The Chairman of the Executive Committee shall be appointed annually by the Director of the Planning and Management Systems Program.

Meetings:

a) The Executive Committee shall meet approximately four times a year. However, additional meetings may be called by the Chairman.

b) The time, place, and agenda of the Executive Committee shall be determined by the Director of the Planning and Management Systems Program in consultation with the Chairman.

c) Unless the Chairman shall rule otherwise, decisions shall be reached by consensus.

d) The Chairman shall state each decision and the major points of discussion leading to the decision so as to afford the opportunity for contrary professional opinion to be recorded.

TECHNICAL COUNCIL: a group to provide advice to the staff on matters concerning the general technical development of the program. The members of the Technical Council will be chosen primarily for their expertise.

Responsibilities:

To provide advice concerning:

a) the technical boundaries for planning and management systems,

b) the technical priorities and feasible alternatives for the program. Major programmatic recommendations by the Technical Council will be reviewed by the Executive Committee.

c) general concepts underlying specific analytical tools and studies,

d) the selection of contractors, major staff appointments, special projects, and research undertakings,

e) selection of institutions for pilot testing centers, and

f) major committee appointments.

Membership:

a) The Technical Council shall consist of no more than twelve (12) appointed members, and four (4) ex-officio members.

b) Members who shall be technically qualified persons, are appointed by the Executive Director of WICHE in consultation with the Director of the Planning and Management Systems Program.

c) Ex-officio members are:

   1) Director of the Planning and Management Systems Program,

   2) Director of the Research Program,

   3) Director of the Development and Applications Program, and

   4) Director of the Training Program.

d) Chairman of the Technical Council shall be appointed by the Executive Director of WICHE in consultation with the Director of the Planning and Management Systems Program.

Meetings:

a) The Technical Council shall meet six times a year. However, additional meeting may be called by the Chairman.

b) The time, place, and agenda shall be determined by the Director of the Planning and Management Systems Program in consultation with the Chairman.

c) Unless the Chairman shall rule otherwise, decisions shall be reached by consensus.

d) The Chairman shall state each decision and the major points of discussion leading to the decision so as to afford the opportunity for contrary professional opinion to be recorded.

TASK FORCES: groups to provide consultation and guidance for each of the projects within the program.

Responsibilities:

to be determined by each project analyst.

Membership:

a) Task forces shall have at least five (5) and no more than eight (8) members.

b) Members are appointed by the Director of the Planning and Management Systems Program.

c) Membership nominations will be solicited from the Level III and IV participants, unless special circumstances necessitate other nominations.

d) Membership on a particular task force is temporary and may be rotated to provide a range of expertise as required by the specific project.

Meetings:

a) Task forces shall meet as needed at the request of the project analyst.

PROCEDURE FOR AMENDMENT

The advisory structure for the Planning and Management Systems Program may be amended at any regular meeting of the WICHE Commissioners.

AMENDMENTS

At such time when a member of an advisory group terminates his position with an institution or agency, his membership on the advisory group in question is automatically terminated. The Executive Director of WICHE and the Director of the Planning and Management Systems Program, who are responsible for selecting his replacement, may consider him for reappointment.